



**U.S. Department of Energy  
Technical Qualification Program**

# ***Occupational Safety Qualification Standard***

## **Study Guide**

**For the**

***General Technical Base  
Qualification Standard***

**April 1996**

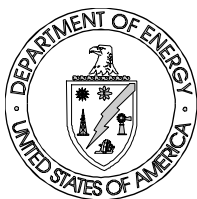


## ***Section 5.0***

### ***Competency 5.1 Personnel shall demonstrate knowledge of the Occupational Safety and Health Act (OSHA) necessary to identify safe/unsafe work practices.***

#### **1. Supporting Knowledge and Skills**

- a. Describe DOE's responsibilities with respect to OSHA including the following:
  - Hazard recognition and evaluation
  - Accident investigation
  - Hazard reduction/elimination
  - Job safety analysis
  - Accident/injury/illness prevention
  - Blood-Borne Pathogens
- b. Using references, discuss the purpose of 29 CFR 1910, Occupational Safety and Health Standards.
- c. Using references, discuss the purpose of 29 CFR 1960, Basic Program Elements for Federal Employee Occupational Safety and Health and Related Matters.
- d. Discuss the regulatory interfaces between OSHA and other regulatory agencies.
- e. Discuss workplace inspection techniques.
- f. Discuss the major components of the OSHA Hazard Communication Protocol.
- g. Using references, discuss the purpose of the following DOE Orders:
  - 3790.1B Federal Employee Occupational Safety and Health Program
  - 5480.1B Environmental, Safety, and Health Programs for DOE Operations
  - 5483.1A Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned-Contractor-Operated (GOCO) Facilities



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### 2. Self-Study Activities (corresponding to the intent of the above competency)

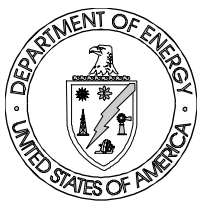
NOTE: Below are three web sites containing many of the references you may need.

Web Sites		
Organization	Site Location	Notes
Department of Energy	<a href="http://cted.inel.gov/cted/index.htm">http://cted.inel.gov/cted/index.htm</a>	DOE Standards, Guides, and Orders.
OSHA	<a href="http://www.osha-slc.gov/">http://www.osha-slc.gov/</a>	OSHA documents and search engine
U.S. House of Representatives	<a href="http://law.house.gov/cfr.htm">http://law.house.gov/cfr.htm</a>	Searchable Code of Federal Regulations

**Scan** the following: 29 CFR 1910, “Occupational Safety and Health Standards;” 29 CFR 1960, “Federal Employee Occupational Safety and Health Program and Related Matters;” DOE Order 3790.1B, *Federal Employee Occupational Safety and Health Program*; DOE Order 5483.1A, *Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned, Contractor-Operated (GOCO) Facilities*; and *Fundamentals of Industrial Hygiene*, 4th edition, pages 531-532 and 769-770.

EXERCISE 5.1-A Describe DOE’s responsibilities with respect to the OSHA requirements listed in the chart below. Cite a reference for each responsibility.

OSHA Requirement	DOE Responsibility	Directives
Hazard recognition and evaluation		
Hazard reduction/elimination		
Accident investigation		
Job safety analysis		
Accident/injury/illness prevention		
Blood-Borne Pathogens		



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**Review** 29 CFR 1910.1, “Occupational Safety and Health Standards,” Purpose and Scope.

**EXERCISE 5.1-B**      Using references, discuss the purpose of 29 CFR 1910, “Occupational Safety and Health Standards.”

**Review** 29 CFR 1960.1, “Basic Program Elements for Federal Employee Occupational Safety and Health Related Matters,” Purpose and Scope.

**EXERCISE 5.1-C**      Using references, discuss the purpose of 29 CFR 1960, “Basic Program Elements for Federal Employee Occupational Safety and Health and Related Matters.”

**EXERCISE 5.1-D**      Discuss the regulatory interfaces between OSHA and other regulatory agencies.

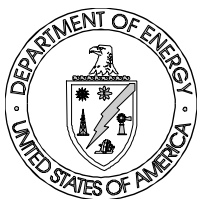
**Review** 29 CFR 1960.26, “Conduct of Inspections.”

**EXERCISE 5.1-E**      Discuss workplace inspection techniques.

**Review** DOE Order 3790.1B, *Federal Employee Occupational Safety and Health Program*; DOE Order 5480.1B, *Environmental, Safety, and Health Programs for DOE Operations*; and DOE Order 5483.1A, *Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned, Contractor-Operated (GOCO) Facilities*.

**EXERCISE 5.1-F**      Complete the matrix below:

DOE Order	Purpose
3790.1B	
5480.1B	
5483.1A	



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### 3. Summary

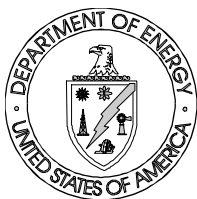
DOE is required to follow OSHA Standards by DOE Orders 3790.1B and 5483.1A, as well as Executive Order 12196, “which establishes policies and responsibilities within Federal departments and agencies for implementation of the Occupational Safety and Health Act of 1970.” Accordingly, a knowledge of the DOE responsibilities, the purpose of the OSHA Code of Federal Regulations, 29 CFR 1910, and the regulatory interfaces between OSHA and DOE is needed.

### 4. Exercise Solutions

EXERCISE 5.1-A Describe DOE's responsibilities with respect to the OSHA requirements listed in the chart below. Cite a reference for each responsibility.

ANSWER 5.1-A

OSHA Requirement	DOE Responsibility	Directives
Hazard recognition and evaluation	Qualified safety and health inspectors conduct formal inspections at least annually of all areas and operations of each workplace. Periodic unannounced inspections are conducted.	DOE Order 3790.1B, Chapter 1.2.b
Hazard reduction/elimination	In imminent danger situations, the hazardous situation is abated immediately. Unsafe and unhealthful working conditions are promptly abated.	DOE Order 3790.1B, Chapter 1.2.b
Accident investigation	Accident investigations shall be conducted in accordance with DOE Order 5484.1, <i>Environmental Protection, Safety and Health Protection Information Reporting Requirements</i> .	DOE Order 5484.1
Job safety analysis	A Process (Job) Safety Analysis provides information which will assist employers and employees in making decisions for improving safety and reducing hazards. . . .	29 CFR 1910.119, Appendix C, 4



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OSHA Requirement	DOE Responsibility	Directives
Accident/injury/illness prevention	Supervisors shall be trained to recognize and eliminate occupational safety and health hazards in their work units.	DOE Order 3790.1B, Chapter V, 2.b.(2)
Blood-Borne Pathogens	Each employer having an employee(s) with occupational exposure as defined by paragraph (b) of this section shall have a written Exposure Control Plan designed to eliminate or minimize employee exposure.	29 CFR 1910.1030 (d)(2)

**EXERCISE 5.1-B** Using references, discuss the purpose of 29 CFR 1910, Occupational Safety and Health Standards.

**ANSWER 5.1-B** To establish standards with which industries are generally familiar, and on whose adoption interested and affected persons have already had an opportunity to express their views. They are: (1) national consensus standards on whose adoption affected persons have reached substantial agreement, or (2) federal standards already established by federal statutes or regulations.

**EXERCISE 5.1-C** Using references, discuss the purpose of 29 CFR 1960, “Basic Program Elements for Federal Employee Occupational Safety and Health and Related Matters.”

**ANSWER 5.1-C** The Secretary of Energy is required to issue basic program elements with which the heads of agencies shall operate their safety and health programs in accordance.

**EXERCISE 5.1-D** Discuss the regulatory interfaces between OSHA and other regulatory agencies.

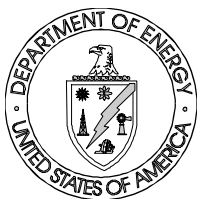
**ANSWER 5.1-D** The Secretary is required to perform various services for the agencies, including consultation, training, recordkeeping, inspections, and evaluations. Agencies are encouraged to seek assistance from the Secretary to comply with the basic program elements and operate effective occupational safety and health programs.



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**EXERCISE 5.1-E**      Discuss workplace inspection techniques.

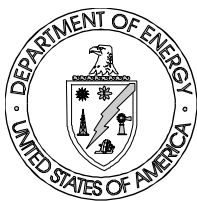
**ANSWER 5.1-E**      Prior to commencement of the inspection, the Safety and Health Inspector shall be provided all relevant information including reports, records, and reports of unsafe working conditions. The Inspector shall determine in advance the actual work procedures and conditions to be inspected.

The head of the agency shall authorize safety and/or health inspectors to: enter without delay any environment where work is performed; inspect and investigate all pertinent conditions, structures, machines, and apparatus; and question privately any employee of the establishment.

**EXERCISE 5.1-F**      Complete the matrix below:

**ANSWER 5.1-F**

<b>DOE Order</b>	<b>Purpose</b>
3790.1B	To set forth policy for the implementation and administration of the Federal Employee Occupational Safety and Health Program for the DOE.
5480.1B	Establishes the Environmental Protection, Safety, and Health Protection Program for DOE operations.
5483.1A	Establishes requirements and procedures to ensure that occupational safety and health standards prescribed provide occupational safety and health protection for DOE employees in GOCO facilities.



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**Competency 5.3** Personnel shall demonstrate knowledge of the principles of electrical safety, referring to OSHA standards and the National Electrical Code, necessary to identify safe/unsafe work practices.

### **1. Supporting Knowledge and Skills**

- a. Discuss the types of protection afforded by the following:
  - Fuses
  - Grounding devices
  - Circuit breakers
- b. Discuss conditions which may result in electrical shock.
- c. Given a workplace situation involving the use of electrical equipment, identify applicable standards using 29 CFR 1910.303(h)(3)(i), Subpart S to determine if the situation is in compliance and discuss the appropriate corrective measures.
- d. Discuss the proper method for removing a victim from an energized circuit.
- e. Discuss the general guidelines in the DOE Electrical Safety Guidelines, DOE/ID-10600

### **2. Self-Study Activities (corresponding to the intent of the above competency)**

NOTE: Below are three web sites containing many of the references you may need.

Web Sites		
Organization	Site Location	Notes
Department of Energy	<a href="http://cted.inel.gov/cted/index.htm">http://cted.inel.gov/cted/index.htm</a>	DOE Standards, Guides, and Orders.
OSHA	<a href="http://www.osha-slc.gov/">http://www.osha-slc.gov/</a>	OSHA documents and search engine
U.S. House of Representatives	<a href="http://law.house.gov/cfr.htm">http://law.house.gov/cfr.htm</a>	Searchable Code of Federal Regulations



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**Review** 29 CFR 1910, Subpart S and DOE/ID-10600: Electrical Safety Guidelines.

- EXERCISE 5.3-A      Discuss the types of protection afforded by the following:
- Fuses
  - Grounding devices
  - Circuit breakers
- EXERCISE 5.3-B      Discuss conditions that may result in electrical shock.
- EXERCISE 5.3-C      Given a workplace situation involving the use of electrical equipment, identify applicable standards using 29 CFR 1910 Subpart S to determine if the situation is in compliance, and discuss the appropriate corrective measures.
- EXERCISE 5.3-D      Discuss the proper method for removing a victim from an energized circuit.
- EXERCISE 5.3-E      Discuss the general guidelines in the DOE Electrical Safety Guidelines, DOE/ID-10600.

### **3. Summary**

In order to identify safe/unsafe work practices and to respond correctly to hazardous situations, personnel need an understanding of electrical safety, basic electrical safety components, and emergency first aid for electrical shock. Knowing how various pieces of electrical devices function will assist the individual in daily work practices.

### **4. Exercise Solutions**

- EXERCISE 5.3-A      Discuss the types of protection afforded by the following:
- Fuses
  - Grounding devices
  - Circuit breakers



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### ANSWER 5.3-A

Device	Protection
Fuses	Overcurrent devices with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A fuse comprises all of the parts that form a unit capable of performing the prescribed functions.
Grounding Devices	Devices used to connect the circuit or equipment to “earth” or to some conducting body that serves in place of earth (ground).
Circuit Breakers	Devices designed to open and close circuits by nonautomatic means and to open circuits on a predetermined overcurrent without injury to the circuit breaker when properly applied within the rated voltage.

EXERCISE 5.3-B      Discuss conditions that may result in electrical shock.

ANSWER 5.3-B      Any condition or situation where an individual might place all or part of his or her body between a source of electrical energy and ground, allowing for current flow through all or part of the body.

EXERCISE 5.3-C      Given a workplace situation involving the use of electrical equipment, identify applicable standards using 29 CFR 1910, Subpart S, to determine if the situation is in compliance, and discuss the appropriate corrective measures.

Scenario: In your workspace, a control panel for an electrical distribution system for the facility is to be installed. Voltages in the system are between 600 volts and 25,000 volts. The wall closest to where the panel is to be installed is a grounded wall constructed of concrete. Using 29 CFR 1910, Subpart S [1910.303(h)(3)(i)Table S-2], determine the "condition" that applies and the minimum distance the panel must be from the grounded wall.



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**ANSWER 5.3-C** Condition 2 states "where there are exposed live components on one side and grounded parts on the other such as concrete, brick, and tile walls that are considered to be grounded parts." The Table gives the distance needed for clearances for the various conditions.

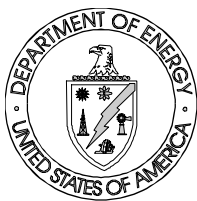
Because this is facility-specific, see your supervisor and have him/her assign a situation within your workspace.

**EXERCISE 5.3-D** Discuss the proper method for removing a victim from an energized circuit.

**ANSWER 5.3-D** The preferred method of removing a person from an energized circuit is to deenergize the circuit before attempting his or her removal. If unable to deenergize, use a nonconducting rope, belt, strap, etc., to separate the person from the "live" source. Failing this, a person can be knocked away from the source by any means necessary.

**EXERCISE 5.3-E** Discuss the general guidelines in the DOE Electrical Safety Guidelines, DOE/ID-10600.

**ANSWER 5.3-E** DOE/ID-10600 provides general guidelines that discuss the reliability and effective maintenance of electrical systems and the planning and design for the layout of the systems, the safety-related training needed, and the testing procedures and the people eligible to perform those tests. These guidelines are to be used to supplement current orders, codes, standards, and regulations.



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**Competency 5.6** Using the Department of Energy Hoisting and Rigging Manual, personnel shall demonstrate knowledge of the principles of material handling, hoisting, and rigging necessary to identify safe/unsafe work practices.

### 1. Supporting Knowledge and Skills

- a. Describe management's responsibility and accountability with regards to hoisting and rigging.
- b. Discuss operating practices for hoisting and rigging operations.
- c. Describe good and bad rigging practices.
- d. Define critical lifts.

### 2. Self-Study Activities (corresponding to the intent of the above competency)

NOTE: Below are three web sites containing many of the references you may need.

Web Sites		
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Department of Energy	<a href="http://cted.inel.gov/cted/index.htm">http://cted.inel.gov/cted/index.htm</a>	DOE Standards, Guides, and Orders.
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U.S. House of Representatives	<a href="http://law.house.gov/cfr.htm">http://law.house.gov/cfr.htm</a>	Searchable Code of Federal Regulations

**Review** 29 CFR 1926, “Safety and Health Regulations for Construction” and DOE/ID-10500, *Department of Energy Hoisting and Rigging Manual*.

EXERCISE 5.6-A Describe management's responsibility and accountability with regards to hoisting and rigging.

EXERCISE 5.6-B Discuss operating practices for hoisting and rigging operations.



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EXERCISE 5.6-C Describe good and bad rigging practices.

EXERCISE 5.6-D Define critical lifts.

### **3. Summary**

A knowledge of general hoisting and rigging practices and where to find the information is needed, especially in the areas of construction. Simple observation of what is going on within a particular facility will let the casual observer learn much about the safety practices, in general, around a work site.

### **4. Exercise Solutions**

EXERCISE 5.6-A Describe management's responsibility and accountability with regards to hoisting and rigging.

ANSWER 5.6-A The safety organization shall review program content for safety significance and include compliance with the training qualification program established and approved by responsible management in its routine audits. Management is responsible to ensure that all operators are trained and qualified prior to operating the equipment.

EXERCISE 5.6-B Discuss operating practices for hoisting and rigging operations.

ANSWER 5.6-B Operating practices listed in 29 CFR 1926.251 - 1926.552 set the limits for the operation of any hoisting and rigging equipment. The practices also place the final responsibility for safe operation of the equipment with the operator.

EXERCISE 5.6-C Describe good and bad rigging practices.

ANSWER 5.6-C Good practices are those that are within the described operating practices listed in the DOE/ID-10500, *Department of Energy Hoisting and Rigging Manual* and bad practices are those that do not fall within those limits.



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EXERCISE 5.6-D Define critical lifts.

ANSWER 5.6-D Critical lifts are lifting operations designated as such because the effect of dropping, upset, or collision of items could:

1. cause significant work delay
2. cause undetectable damage
3. result in significant release of radioactivity or other undesirable conditions
4. present a potentially unacceptable risk of personal injury or property damage